

The Underpinning Theories of Cognitive Readiness in Social Sciences Research

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Abstract

This article focuses on the selected theories relevant to the development of military cognitive readiness from a social science perspective. Military cognitive readiness consists of military knowledge, skills, and abilities that require military personnel to maintain readiness in military contexts. By referring to social science research, this article aims to identify relevant theories for enhancing military cognitive readiness. The selected theories involve military cognitive readiness theory, human resource development theory, and cognitive readiness theory. Through the integration of these theories, this article seeks to provide a comprehensive understanding of the process development of military personnel readiness, offering a foundation for future empirical studies and potential implications for military organizations to accomplish missions in military operations.

Keywords: Cognitive Readiness, Military Personnel, Military Cognitive Readiness Theory, Human Resource Development Theory, Transfer of Training Theory

Introduction

In recent years, the increasing complexity and technological advancements in the nature of modern warfare demand military personnel to be cognitively ready for deployment in military operations (Billing et al., 2021). This heightened interest in the understanding of how to maintain military personnel readiness to perform effectively in modern warfare through the concept of cognitive readiness. Morrison & Fletcher (2002) define the concept of cognitive readiness (CR) as related to the mental preparation (including skills, knowledge, abilities, motivations, and personal dispositions) to sustain competently in the complex environment of military operations. The term CR was discussed in a context related to human

performance such as defense, emergency services, and professional sports to measure the mental state of an individual in an organization that would assist in predicting the future performance of their working personnel.

Crameri et al., (2021), argue that with a shift in military operations toward a new battle space characterized by multi-domain operations needs military organizations to focus on military personnel capability and adaptability in this evolving operational landscape. Researchers explain that the dynamic, complex, and unpredictable environments of military operations require a state of readiness of military personnel's knowledge, skills, and abilities (KSAs) that enable them to think critically, problem-solving, and decisions making (Crameri et al., 2021; Sangwan & Raj, 2021; Brunyé et al., 2020). Ensuring military personnel and teams are equipped with the essential KSAs leads to success in various operational contexts.

The concept of CR remained unanswered regarding what theory evolving and how the process of preparing military personnel CR for actual performance in the operational environment. Addressing these questions will require identifying the underpinning theories related to CR. Therefore, selected relevant theories from a social science perspective need to be identified that contribute to the development of CR military personnel.

Underpinning Theories

In the military context, the readiness of military personnel has been debated by military leaders for mission success. The development of CR has gained significant attention in determining the preparation of military organization combat readiness, especially military personnel. Military personnel is an essential factor must be prepared to fight the missions and tasks assigned to them (Nindl & Kyröläinen, 2022; Kyröläinen et al., 2018; MacLean & Cahillane, 2015). To have a better understanding of what CR is and how the process affects CR military personnel need to answer some basic questions. What does it mean to be cognitively ready? What are the attributes of CR? And how does the process of CR readiness occur? Answers to all three questions fundamentally matter of human dimension; what it means to be cognitively "ready" can only be understood in the context human dimension of military personnel for three levels of war-fighting readiness: strategic, operational, and tactical.

To remain cognitively ready in complex operating environment, military organization must identify the ways to improve military personnel readiness. Abidin, (2014), argues that the complex operational environment require of better understanding moral, cognitive, and physical aspects of the human dimension of soldiering. These aspects meet the requirement of a complex operational environment for future operations that need to be prepared to execute their assigned missions. Due to increasing technological advancement and the complexities of military operations, the cognitive dimension becoming an important aspect of military personnel at all levels (strategic, operational, and tactical) able to think critically, problem-solving, and decisions making in the military context (Grier, 2012; Grier, 2011). Hence, the underpinning theories related to the CR concept for the development of military personnel who are cognitively ready for complex conditions and sustain in military operations.

Human resource development (HRD) is fundamental in theory building to address CR's theoretical concept. For this reason, HRD theory offers a means of providing a process for developing human expertise through organization development and training development for improving performance (Wang & Swanson, 2008; Swanson, 2001; Swanson, 1995). Singh & Gupta, (2021) explained that knowledge management is an essential tool for sustaining

competitiveness environment for an organization. Similarly, for a military organization, a complex operational environment is a phenomenon that requires military organizations to establish KSAs before being deployed for military operations. The process of development of CR military personnel through an exploration of theories such as system theory, psychology theory, and economic theory in order to enhance human performance of military personnel. These theories provide an understanding and consideration of how military organizations have to prepare human expertise at each level (strategic, operational, and tactical) to maintain combat readiness.

Improving mission success has created an urgent need for military organizations to refer to the concept of CR. Military organizations have to ensure the level of military personnel readiness is ready to deal with the operational environment can be understood in the context of CR theory, especially Strategic CR theory (SCR), Operational CR theory, and Tactical CR theory. Based on the need for operational environment requirements, the formation of CR at all levels (strategic, operational, and tactical) of military personnel is directly related to military training and education. For example, researchers found that to achieve personal readiness and optimize human performance in environments of military operation should focus on building cognitive and resilience skills through realistic military training (Patton et al., 2019; Dyer, 2004). Military training can be considered a systematic approach to be aligned with the increasing complexities and uncertainty of military operations. In this regard, military training provide and improve military personnel readiness with KSAs. Furthermore, the KSAs gained from military training will be utilized in their assigned mission. Therefore, referring to CR theory and HRD theory, have the potential for the development of military personnel CR in military organizations.

Figure 1.0 describe the selected theories that embedded military CR for social science research.

Figure 1.0: The underpinning Theories for the development CR of military personnel

Theory	
Cognitive Readiness (CR)	Strategic CR theory (SCR) Operational CR theory (OCR) Tactical CR theory (TCR)
Human Resource Development (HRD)	System theory Psychology theory Economic theory

Cognitive Readiness Theory

Military leaders need to understand explanations of how the theories can effectively relate to achieving military personnel readiness at all levels (strategic, operational, and tactical) connected to CR and human performance. Military CR is a somewhat new concept to effectively navigate the challenges and contribute to mission success (Crameri et al.,2021; Etter, 2002). By focusing on the human dimension of soldiering especially the cognitive required in an era of uncertainty and cognitively ready for deployment. Crameri et al., (2021), argue the nature of the military operations environment by providing a review related to a comprehensive theoretical development cognitive readiness theory. Thus, the potential and

application of the CR concept in the defense domain require military personnel to engage in complex task environments. Where is it to begin?

The multi-domain operations in an era of volatility, uncertainty, complexities, and ambiguity (VUCA) lead to a military interest in the development of cognitive readiness potential to translate their capability into performance during military operations. Originally, the concept of CR discussed the mental preparation of military personnel that predict future performance. In the context of military fighting, Harrison, (2014), explains that all levels of military personnel need to be trained and ready. According to Crameri et al., (2021), the CR concept has three interrelated subconstructs: strategic cognitive readiness (SCR), operational cognitive readiness (OCR), and tactical cognitive readiness (TCR). To begin the explanation, it is necessary to highlight three interrelated subconstructs of CR related to cognitive performance in complex, uncertain, and stressful military personnel because the nature of performance differs for each level.

When discussing the cognitive readiness of military personnel, it is essential to start by understanding SCR. SCR refers to the potential of “an individual” of military personnel to perform particularly in complex and modern military operations (Grier, 2012). Effective cognitive readiness enables military personnel at the strategic level of the military organization carry out planning and strategy to understand complex situations, anticipate potential threats, and decisive action. In challenging and unpredictable operational environments, military personnel at the strategy level require strong cognitive readiness to think critically and creatively about how to overcome challenges and obstacles (Fletcher & Wind, 2013). With cognitive readiness, enables them to respond effectively by recognizing the pattern and interpretation of situational cues to take decisions by evaluating options and weighing risks ultimately contributing to mission success.

Adopted from Morrison and Fletcher’s (2002) original definition of CR, Grier, (2012), defines that the OCR definition refers to military personnel's mental preparation with military knowledge, skills, and abilities including motivation needs to be established in the modern military operation. To sustain competent performance in a complex and unpredictable environment, Grier, (2012) explained that military personnel’s CR in the context of military fighting has to be well-trained and equipped before deployment on a mission. By addressing specific cognitive needs such as critical thinking, decision-making, problem-solving, and situational awareness, enabling military personnel at the operational level to perform at their best in complex operational environments. At the operational level in military organizations, planning and identifying objectives to achieve mission success is an essential requirement. An integrated plan requires cognitive performance to analyze complex operational factors, such as political landscape, geographical considerations, and the capabilities and intentions of potential adversaries of each operational context

Grier, (2011) defines TCR as a state of military personnel's cognitive readiness at the tactical level for ensuring an acceptable level of performance during assigned missions. Cognitive abilities, skills, and mindset are essential for military personnel need to establish. These capabilities enable military personnel to effectively carry out tactical responsibilities, make rapid decisions, adapt to changing situations and contribute to mission success. In military operations, tactics, techniques, and procedures (TTP) provide a structured approach and guidelines for military personnel to execute their tactical responsibilities effectively. When it comes to cognitive readiness, TTP can be seen as a framework that military personnel should follow in response to different situations on how to perform specific tasks or operations. Cognitive readiness allows military personnel at the tactical level to process

information efficiently, analyze the situation, assess available options, consider potential risks, and select the most appropriate TTP to accomplish their mission objective. In response to this need, integrating HRD theories provide valuable insight into how HRD principles and practice into the development of CR.

Human Resource Development Theory

The field of HRD emphasizes three major areas in workplace organizations; training and development, career development, and organization development (Fenwick, 2004). To meet security challenges, the CR concept focuses on preparing military personnel to effectively engage in complex demanding tasks. The security challenges of 21st-century military operations involve performance skills that require military personnel who are cognitively ready. HRD theory highlights the significance of a pathway for military organizations with the process aimed at enhancing the KSAs to develop military personnel readiness. Key component in HRD theory is system theory, psychology theory, and economic theory (Swanson, 1995). These theories offer an accurate picture that provides valuable insight into managing an organization and how to be applied in a military setting to develop CR of military personnel. System Theory explains the dynamic interaction between an organization and its environment to perform in challenging situations. It highlights that organizations must be responsive and adaptive to changes in their environment. In the military context, system theory provides valuable for understanding the complex operating environment for adjusting strategies, revising structures, realigning resources, and developing new capabilities to effectively respond to the complexities of the military environment. By applying system theory, the military organization can gain a deeper understanding between the military system and the operational environment that provide military leaders to maintain and improve the military level of war and readiness (strategic, operational, and tactical). This established a new concept to enhance human performance with an emphasis on the coordination of man (military personnel), machine (technology), and method (doctrine) for military strategy. In addition, the nature of the military environment is complex, uncertain, and stressful requiring the military organization to select, design, develop and train military personnel to develop CR for mission success. Military personnel became an essential factor in sustaining competence for dealing with modern military operations. Identifying and developing a military training system for military cognitive readiness by preparing military personnel who are the best capable of handling uncertain and unpredictable environments of military operations (Soeters, 2022; Herlihy, 2022; Hasselbladh & Yden, 2020; Hallal-Kirk et al., 2019).

Psychology theory captures core human aspects involving human behavior, thought, emotion, and mental process. This theory provides understanding and explains aspects of human psychology including cognition, motivation, and personality. By exploring this theory, military organizations gain a deeper understanding of the complexities of the human mind and behavior. This theory also provides military leaders the foundation for evaluating and predicting the changes and process development of physical, cognitive, and emotional and how these aspects interact and influence. Furthermore, this theory offers a unique perspective and insight that contribute to the development of CR military personnel to be ready for deployment in complex operational environments. Military personnel must be prepared to fight for their country. With increasing operational requirements, human cognition is vital to overall mission effectiveness achieving mission goals, and maintaining CR. To overcome these challenges, researchers argue how psychology could contribute to the war

effort including areas such as selection, training, motivation, stress, and emotional well-being of military personnel (Pawiński & Chami, 2019; Friedl, 2018; Harms et al., 2013; Driskell & Olmstead, 1989; Gagne, 1962). It suggested that the application of psychology to military needs played a significant role to defend the country, to be able to fight and win a war if necessary.

In context, economic theory, efficient and effective utilization of resources to accomplish organizational goals in a competitive environment is important to improving and maintaining human performance. Military organizations, first need a better understanding of what are the attributes of a ready force. It also refers to how budget decisions affect readiness. Military training is costly due to several factors. The complex operating environment in a military operation is complex and uncertain requiring military leaders must make a strategic decision regarding the allocation of budget to train military personnel and infrastructure development. These decision impact the military readiness to attain its goals. For example, Harrison (2014) explains that US military plans to spend more than \$5 trillion on readiness in all its forms over the next decade. Economic theory provides valuable insight into the principle and strategies that guide the military organization in resource allocation strategy. Knowing warfighting environments and threats enables the military organization to assess the readiness of its personnel. Military personnel must be prepared to fight and optimize their cognitive capabilities accordingly at all levels of military organizations (strategic, operational, and tactical) in modern warfare.

With the increasingly fast-paced nature of modern military operations, Nindl et al., (2018) suggested that there is a need for a strategic paradigm shift in military organizations to maintain military personnel readiness for success. Building cognitive capabilities in every military personnel is essential to combat readiness starting with clear policies, training, doctrine, and measurable standards. Military organizations must understand related theories involving CR theories and HRD theories for the development of military cognitive readiness to enhance commanders' and war fighters' performance during worldwide operations.

Conclusion and Future Directions

Maintaining military cognitive readiness (CR) is vital in warfighting or peacekeeping operations that demand military personnel are cognitively ready. Military knowledge, skills, and abilities (KSA) are closely connected to the development of cognitive processes and capabilities that contribute to CR. Moreover, understanding the concept of CR allows military organizations to prepare for fighting and winning their next war. This is to ensure that the right individual is deployed where their cognitive capabilities can be effectively utilized in executing military missions. Referring to the potential science of training offers how factors that influence the transfer of training related to the development of CR suitability for specific roles and tasks within the military domain. It helps military organizations to develop training systems to train and educate individuals who are likely to excel in cognitively demanding positions, selecting candidates for a specialized training program in the military context.

The nature of military tasks demands cognitive capabilities under of variety of military operational environments that contribute to military personnel performance. Future work should be on the developed conceptual framework of the CR model that has significant potential to enhance the cognitive capabilities of current and future soldiers. Military organizations have to invest in research and development efforts, ultimately preparing military personnel who are cognitively ready for the complex operating environment of the military operation. In addition, more works need to be addressed through an expansion of

interdisciplinary research and a combination of a variety of methodological approaches. Finally, the collaboration and coordination among military and academic research communities to enhance military personnel performance is a necessary in order to enhance the development of military personnel CR for the modern warfare environment.

References

- Abidin, Z. B. H. Z. (2014). The human dimensions of soldering: A perspective on future requirements in the complex operational environment. In *1st International Conference On Social Sciences and Humanities, ICSH 2014*, 394.
- Billing, D. C., Fordy, G. R., Friedl, K. E., & Hasselstrøm, H. (2021). The implications of emerging technology on military human performance research priorities. *Journal of Science and Medicine in Sport*, 24(10), 947-953.
- Blacker, K. J., Hamilton, J., Roush, G., Pettijohn, K. A., & Biggs, A. T. (2019). Cognitive training for military application: a review of the literature and practical guide. *Journal of cognitive enhancement*, 3, 30-51.
- Brunyé, T. T., Brou, R., Doty, T. J., Gregory, F. D., Hussey, E. K., Lieberman, H. R., ... & Yu, A. B. (2020). A review of US Army research contributing to cognitive enhancement in military contexts. *Journal of Cognitive Enhancement*, 4, 453-468.
- Crameri, L., Hettiarachchi, I., & Hanoun, S. (2021). A review of individual operational cognitive readiness: theory development and future directions. *Human factors*, 63(1), 66-87.
- Cuevas, H. M., & Schmorow, D. D. (2012). Exploring cognitive readiness in complex operational environments: Advances in theory and practice. In *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, 56(1), 433-434.
- Dyer, J. L. (2004). The measurement of individual and unit expertise. In *The Science and Simulation of Human Performance*, 5, 11-124.
- Driskell, J. E., & Olmstead, B. (1989). Psychology and the military: Research applications and trends. *American Psychologist*, 44(1), 43.
- Etter, D. M. (2002). Cognitive readiness: An important research focus for national security. *Converging technologies for improving human performance*, 330.
- Fletcher, J. D., & Wind, A. P. (2013). The evolving definition of cognitive readiness for military operations. In *Teaching and measuring cognitive readiness*, 25-52.
- Fenwick, T. J. (2004). Toward a critical HRD in theory and practice. *Adult Education Quarterly*, 54(3), 193-209.
- Friedl, K. E. (2018). Military applications of soldier physiological monitoring. *Journal of science and medicine in sport*, 21(11), 1147-1153.
- Gagne, R. M. (1962). Military training and principles of learning. *American psychologist*, 17(2), 83.
- Garcia, A., Ganey, N., & Wilbert, J. (2017). Human readiness assessment: A multivariate approach. In *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, 61(1), 106-109.
- Grier, R. A. (2012). Military cognitive readiness at the operational and strategic levels: A theoretical model for measurement development. *Journal of Cognitive Engineering and Decision Making*, 6(4), 358-392.
- Grier, R. A. (2011). Cognitive readiness at the tactical level: A review of measures. In *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, 55(1), 404-408.

- Hallal-Kirk, L., Patton, D. J., Johnston, J., Milham, L., Townsend, L., & Riddle, D. (2019). Training for readiness and resilience: Supplemental findings. In *International Conference on Applied Human Factors and Ergonomics*, 165-175.
- Harms, P. D., Krasikova, D. V., Vanhove, A. J., Herian, M. N., & Lester, P. B. (2013). Stress and emotional well-being in military organizations. In *The role of emotion and emotion regulation in job stress and well being*, 11, 103-132.
- Harrison, T. (2014). Rethinking readiness. *Strategic Studies Quarterly*, 8(3), 38-68.
- Hasselbladh, H., & Yden, K. (2020). Why military organizations are cautious about learning?. *Armed Forces & Society*, 46(3), 475-494.
- Herlihy, D. J. (2022). Cognitive performance enhancement for multi-domain operations. *The US Army War College Quarterly: Parameters*, 52(4), 13.
- Hildt, E. (2013). Cognitive enhancement—A critical look at the recent debate. *Cognitive enhancement: an interdisciplinary perspective*, 1-14.
- Kyröläinen, H., Pihlainen, K., Vaara, J. P., Ojanen, T., & Santtila, M. (2018). Optimising training adaptations and performance in military environment. *Journal of science and medicine in sport*, 21(11), 1131-1138.
- MacLean, P., & Cahillane, M. (2015). The human factor in learning design, research, policy, and practice. *The International Journal of Information and Learning Technology*, 32(3), 182-196.
- Morrison, J. E., & Fletcher, J. D. (2002). Cognitive readiness. Institute for defense analyses Alexandria VA.
- Nindl, B. C., & Kyröläinen, H. (2022). Military human performance optimization: Contemporary issues for sustained and improved readiness. *European Journal of Sport Science*, 22(1), 1-3.
- Nindl, B. C., Billing, D. C., Drain, J. R., Beckner, M. E., Greeves, J., Groeller, H., ... & Friedl, K. E. (2018). Perspectives on resilience for military readiness and preparedness: report of an international military physiology roundtable. *Journal of science and medicine in sport*, 21(11), 1116-1124.
- Patton, D., Johnston, J., Gamble, K., Milham, L., Townsend, L., Riddle, D., & Phillips, H. (2019). Training for readiness and resilience. In *Advances in Human Error, Reliability, Resilience, and Performance: Proceedings of the AHFE 2018 International Conference on Human Error, Reliability, Resilience, and Performance*, 292-302.
- Pawiński, M., & Chami, G. (2019). Why they fight? Reconsidering the role of motivation in combat environments. *Defence Studies*, 19(3), 297-317.
- Prykhodko, I., Lyman, A., Matsehora, Y., Yurieva, N., Balabanova, L., Hunbin, K., ... & Morkvin, D. (2021). The psychological readiness model of military personnel to take risks during a combat deployment. *BRAIN. Broad Research in Artificial Intelligence and Neuroscience*, 12(3), 64-78.
- Sangwan, D., & Raj, P. (2021). The philosophy of Be, Know, and Do in forming the 21st-century military war-front competencies: a systematic review. *Defence Studies*, 21(3), 375-424.
- Singh, M. K., & Gupta, V. (2021). Critical types of knowledge loss in military organisations. *VINE journal of information and knowledge management systems*, 51(4), 618-635.
- Soeters, J. (2022). Why it is important to be cautious in the analysis of military organizations: A reply to Hasselbladh and Ydén. *Armed Forces & Society*, 48(2), 480-485.

- Swanson, R. A. (2001). Human resource development and its underlying theory. *Human Resource Development International*, 4(3), 299-312.
- Swanson, R. A. (1995). Human resource development: Performance is the key. *Human resource development quarterly*, 6(2), 207-213.
- Wang, G. G., & Swanson, R. A. (2008). The idea of national HRD: An analysis based on economics and theory development methodology. *Human Resource Development Review*, 7(1), 79-106.